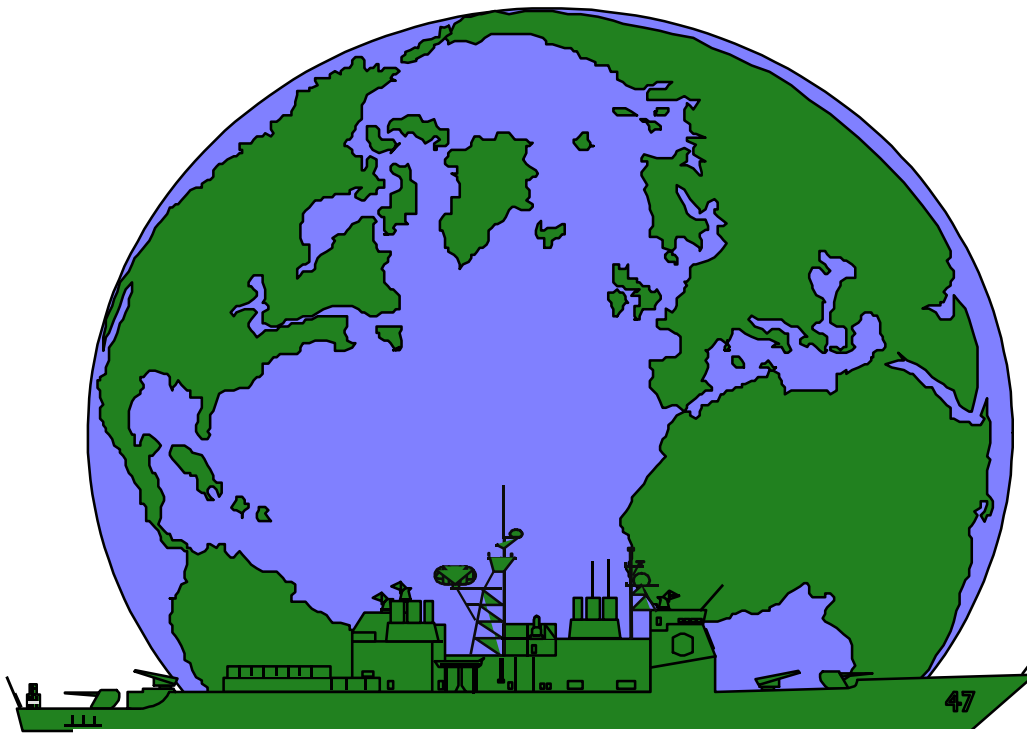


Report of the Fleet Wide Environmental Survey

Conducted at the direction of
The Ship Design Standards
Process Action Team



Prepared For:
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1. EXECUTIVE SUMMARY

The Ship Design Standards Process Action Team (SDS PAT) is one of the four environmental PATs chartered by the Environmental Protection Systems Quality Management Board (EPS QMB). This board, chaired by Director, Environmental Protection, Safety, & Occupational Health Division (CNO N45), was established to evaluate current Navy operational practices and design towards the goal of responsible environmental stewardship. The PAT chairman is Deputy Commander for Engineering, Naval Sea Systems Command (SEA 03). The PAT team led by CAPT Greg Sanford, Deputy Director, Environmental and Auxiliary Systems Group (SEA 03LB), was directed by SEA 03 to determine the current environmental needs of the Fleet. The Fleet Wide Environmental Questionnaire (FWEQ) was conducted to achieve this objective.

This report provides the findings and recommendations of the SDS PAT's FWEQ initiative. The FWEQ was developed to obtain Fleet input on environmental issues, compare the results to current NAVSEA efforts, and identify the ensuing courses of action to alleviate the Fleet's concerns. A brief synopsis of each major area of concern is provided in Section 2.

A four person survey team visited San Diego and Norfolk to collect a representative sampling from available units. The team administered the questionnaire to seventeen ships including CV/CVNs, L-Class, CGs, DD/DDGs, FFGs, and an AOE. Over 500 data points were obtained during the two one-week visits. Interviews were conducted across the complete command structure from Commanding Officer to deckplate Sailors.

The questionnaire consisted of eight sections. These sections were designed to solicit feedback in the areas of: 1) Air, 2) Non-Oily Liquid Discharges, 3) Oil and Oily Waste, 4) Hazardous Materials, 5) Oil and Hazardous Substance Spills, 6) Solid Waste, 7) Medical Waste, and 8) Other Environmental Concerns.

The endeavor to achieve environmental compliance is paramount in the U.S. Navy. This report provides "voices from the Fleet", operating in a demanding shipboard environment, while struggling daily to maintain environmental compliance. The report analyzes the Fleet concerns and examines potential solutions to alleviate these concerns. The findings have been compared by the Program Life Cycle Managers to existing ongoing efforts to improve environmental awareness, training, equipment and instructions.

The survey teams found the ships well prepared and eager to share their experiences and ideas for the future of environmental protection systems and procedures. This effort was extremely important in verifying that NAVSEA's programmatic efforts are supporting Fleet operations and afloat quality of life issues. The FWEQ provided positive confirmation on the direction and approach that NAVSEA has taken on most issues, while also providing lessons learned on areas that require more attention for today's ships as well as future ship designs. The Fleet is eager to implement the equipment, administrative, and technical solutions to ensure success.

The major Fleet concerns are shown in FIGURE 1-1.

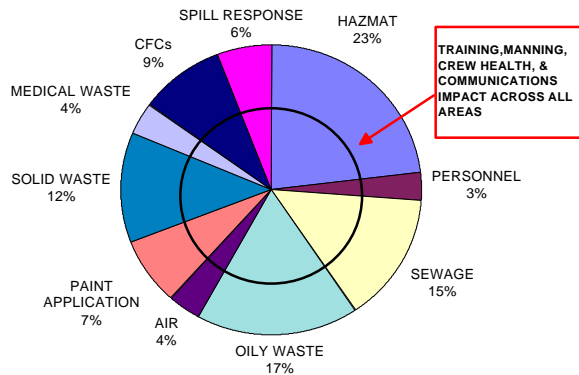


FIGURE 1-1 FLEET CONCERNS BY CATEGORY

1.2 RECOMMENDATIONS

The SDS PAT recommends:

- The EPS QMB should charter a Process Action Team to review communication and training issues. This survey found that, for a variety of reasons, accurate information is not consistently available to our first line of defense, the deckplate Sailor.
- A single source document detailing environmental regulations and compliance methods should be developed as soon as possible for distribution to the Fleet.
- To enhance crew training for environmental compliance, a Ship's Environmental Protection Coordinator billet should be developed as a primary NEC.
- The Navy should designate a Life Cycle Manager for Oil and Hazardous Substance Spill issues.
- Navy General Military Training (GMT) must be reviewed to ensure adequate coverage of environmental issues.
- Additional research should be conducted in the areas of training and manning with the cognizant outside agencies.
- A follow-on survey should be conducted biennially to ensure continued environmental compliance and provide additional analysis by ship class.
- A copy of this report and the OPNAV U.S. Navy Pollution Discharge Restrictions Wheel will be forwarded to each ship, squadron, group, and Fleet Commander.

2. ENVIRONMENTAL ISSUES SYNOPSES

2.1 PERSONNEL

2.1.1 TRAINING

Training needs were identified in correlation to each section of the questionnaire. General consensus by respondents focused on additional training for environmental equipment and procedures, and environmental awareness training for the entire crew, including embarked units on amphibious ships. The Fleet is eager to comply with regulations, but additional tools to ensure the operation of an environmentally sound ship are required. Officers and crew strive to comply with regulations; however, instructions often contain conflicting information or information that is difficult to interpret, resulting in misinformation and misinterpretation of environmental requirements at all levels of command. Some ships were subsequently overachieving in many areas and adversely impacting quality of life in order to meet requirements that do not exist. **A single source document detailing clear, concise environmental regulations and compliance methods was repeatedly requested.**

2.1.2 PRIMARY NEC

The Fleet repeatedly expressed a need to elevate Navy Enlisted Classification (NEC) Code 9595, Hazardous Material Control & Management (HMC&M) Technician, from a secondary to a primary NEC due to the need to comply with rapidly evolving worldwide environmental regulations. **Commanding Officers and Executive Officers were unanimous in their recommendation for a Ship's Environmental Protection Coordinator to advise, train, and coordinate ships force on environmental compliance issues, thereby ensuring the operation of an environmentally sound ship. Upgrading the HMC&M technician in this capacity would be one solution to this defined need.**

2.1.3 MANNING ISSUES

In much the same manner as training, the manning issues cross nearly all Questionnaire sections. Participants in the survey requested that additional personnel be provided to meet environmental requirements both in operating and maintaining pollution prevention equipment and to act as onboard environmental experts (i.e., the HMC&M NEC).

2.1.4 CREW HEALTH

The Fleet expressed health and safety concerns related to occupational hazards. Unavoidable exposure to paint fumes and hazardous materials was frequently cited. Sanitation issues were also expressed in relation to sewage system overflows and garbage storage.

2.1.5 COMMUNICATION

It is imperative that the Fleet be kept abreast of pollution abatement equipment installed onboard their ship in an effort to achieve environmental compliance. Some individuals in the Fleet were unaware of current initiatives under development to improve shipboard quality of life. In an effort to publicize a wider variety of environmental issues, NAVSEA 03L has evolved the CFC/Halon Clearinghouse into the Shipboard Environmental Information Clearinghouse (SEIC). The SEIC Shipboard Environmental Protection Newsletter and SEIC Website (<http://navyseic.com>) provide the Fleet with one stop shopping for Afloat Environmental Protection Information.

2.2 HAZARDOUS MATERIALS (HM)

The areas of HM identified as requiring increased awareness by the Fleet are categorized below. Concerns include: units of issue sizes and cost of procured items; excess amounts of HM created by large units of issue and HM left onboard by contractors; inadequately sized and inconveniently located storage space; sufficient and consistent guidance on HM handling; and more available and in-depth training for all personnel, particularly embarked units and those assigned to man the Hazardous Material Minimization Center (HAZMINCEN).

Many programs are currently being implemented to reduce the Fleet-Wide HM burden:

- CNO N45, Pollution Prevention Afloat Programs to reduce volume and types of HM;
- NAVSEA 03R16 Shipboard HM Minimization Program to substitute materials and modify processes to use less or non-hazardous materials;
- NAVSUP restrictions on purchase of non-Ships Hazardous Material List items;
- CNO N45, standardization of ship-to-shore transfer;
- Regional HM Program Offices to aid in the implementation and improvement of the Consolidated Hazardous Material Reutilization and Inventory Management Program (CHRIMP);
- Joint Surface Type Commander (TYCOM) HM Management Instruction and revision of NAVSUPPUB 485 Afloat Supply Manual to provide more thorough implementation guidance; and
- Restricted number of ratings for Secondary Navy Enlisted Classification (SNEC), mandate for Hazardous Material Inventory and Control System (HICS) and HM supervisor, and integration of Air and Marine detachments into HAZMINCEN operations.

Issues requiring further investigation in this area include:

- Incorporation of smaller units of issue in the Planned Maintenance System (PMS);
- Authorization to purchase and use General Use Consumable List (GUCL) items if less expensive than National Stock Number (NSN) items;
- Satellite storage lockers in Work Centers for more convenient, round-the-clock access to PMS required HM; and
- Yearly ship-wide HM training, modeled after the Hazardous Waste Operations and Emergency Response (HAZWOPER) course at Naval Amphibious Base (NAB) Coronado.

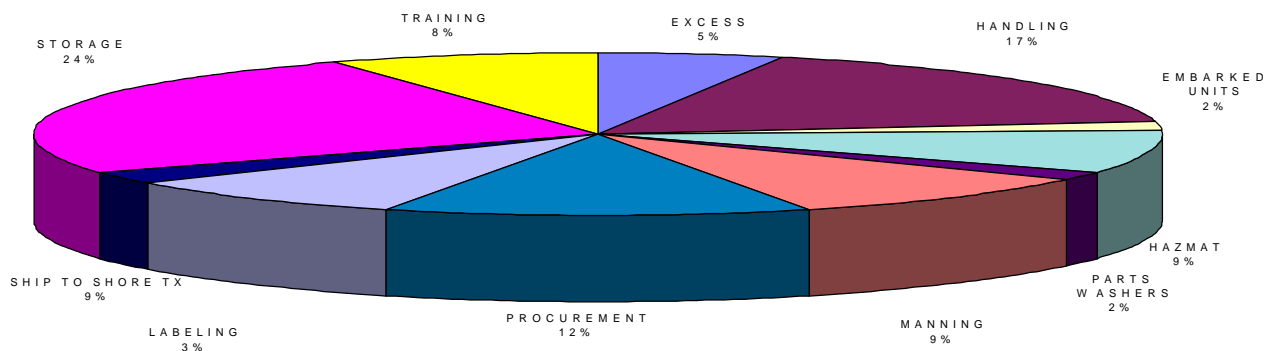


FIGURE 2-1 HAZARDOUS MATERIAL ISSUES

2.3 OIL & OILY WASTE

Controlling oil discharges has become a major driver in Navy operations. As one Chief Engineer stated, "We plan our operations around oily waste."

Common issues with Oil Water Separators (OWS) and Oil Content Monitors (OCM) include the OWS degradation due to long lived emulsifying detergents and Aqueous Film Forming Foam (AFFF), and the reliability of OCM to monitor oil concentrations to 15 ppm. Other concerns encompassed Refueling/Defueling operations, unreliable Tank Level Indicators (TLIs), oily deck run-off, aviation fuel tank stripping, and catapult system oily discharge on aircraft carriers.

Current solutions being developed include:

- Membrane Polishing System to achieve < 15 ppm discharge;
- Certification program for all Oil Pollution Abatement Systems;
- Procedure for more convenient and effective calibration of the OCM;
- Improved Tank Level Indicators;
- Commercial Item Description of OWS compatible detergents; and
- Development of Uniform National Discharge Standards (UNDS) to establish a consistent set of vessel effluent standards.

Suggestions from the Fleet include:

- Increased flowrate of OWS;
- Alarm and automatic shutdown for OWS failures;
- Control measures for deck run-off;
- Provide means of capturing catapult trough drain discharge and catapult water brake discharge;
- Provide method to capture aviation fuel strippings; and
- Provide mechanism to ensure attendance at OWS school.

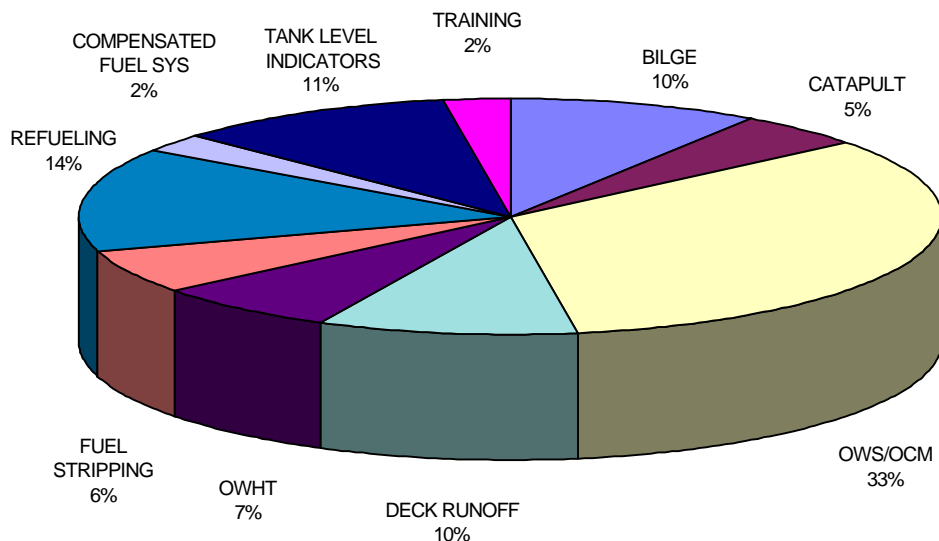


FIGURE 2-2 OIL & OILY WASTE ISSUES

2.4 SEWAGE SYSTEMS

Some ships reported that their sewage systems were inadequate because of insufficient tank capacity, inability to cross connect, and limited opportunity for regular cleaning. These caused quality of life and sanitation issues, and in some cases, forced ships to interrupt littoral operations and adjust their mission in order to legally discharge effluent.

Current NAVSEA efforts to improve the systems include:

- Long-term research to develop an ultrafiltration membrane system that discharges an acceptable effluent of oil and sewage (Type II Marine Sanitation Device);
- Ongoing research into minimizing water usage, which includes initiatives such as waterless urinals;
- Providing greater capacity to hold graywater and installing cross connecting ability on new ships;
- Conversion of Sewage Treatment Plants (STP) to Collection, Holding, and Transfer (CHT) system (CHT) in LHA 1 Class Ships;
- Mechanical modifications to improve the reliability of DD 963/993 Class Vacuum Collection and Holding (VCHT) Systems including the sewage incinerators;
- Employing new reliability features in sewage tank level sensors (stock system recently began procuring new improved level sensors);
- Testing new design concepts for sewage tank level sensors;
- Testing new sewage pump mechanical seals that are easy to install and less prone to misalignment during installation; and
- Evaluating possibility of eliminating comminutors on CV/CVNs.

Suggestions from the Fleet include:

- More frequent hydroblasting;
- Establish VCHT school; and
- Ship class specific training.

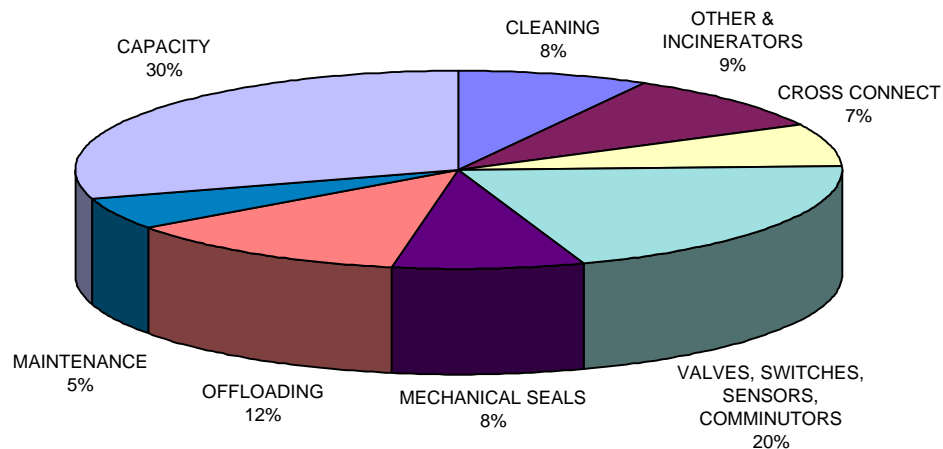


FIGURE 2-3 SEWAGE ISSUES

2.5 SOLID WASTE

The storage of excessive amounts of plastic material, food waste, and packaging material was burdensome and unsanitary for all ships not currently equipped with solid waste management equipment. Considerable operational impacts resulted from the need to interrupt operations in order to dispose of trash. The solid waste equipment suite of Plastics Waste Processor (PWP), Solid Waste (Metal/Glass) Shredder, and Pulpers are designed to relieve these difficulties. Installation of the PWP is currently in progress on many ships, and is in high demand on all others. PWP installations can not be achieved as fast as the Fleet would like due to: 1) a limited quantity of PWPs that can be produced per month, and 2) ships' schedules for FMPMIS availabilities. Installation difficulties were reported by ships in addition to equipment installation without adequate training. Soda cans were pointed out as a significant contributor to the trash stream (a CV can generate 4800 in a day).

These reported problems should be remedied by the following NAVSEA efforts:

- NAVSEA 03L, by Congressional mandate, is in the process of installing the PWP on all ships by 31 Dec 1998;
- Installation of Metal/Glass Shredder and Pulpers by 31 Dec 2000;
- The Interactive Courseware (ICW) CD ROM training for PWP is sent three weeks prior to installation; and
- Onboard training from Naval Surface Warfare Center, Carderock Division, Ship Systems Engineering Station (NSWCCD-SSSES) after installation.

Additional suggestions from the Fleet include:

- Model shoreside plastic recycling program at Naval Station (NAVSTA) Norfolk after NAVSTA San Diego program;
- Reduction of packaging material or substitution with biodegradable material;
- Replace galley operations with prepackaged meals and microwaves;
- Replace soda machines with liquid dispensers and paper cups;
- Reexamine policy of retaining garbage that is subsequently dumped into the ocean by the host nation; and
- Provide deck coaming around PWP .

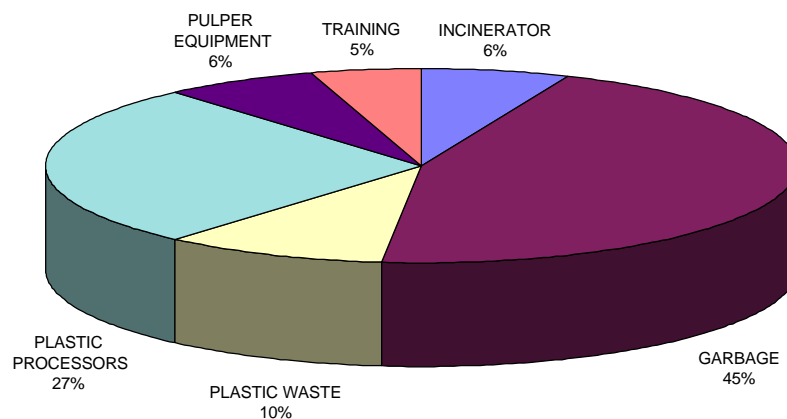


FIGURE 2-4 SOLID WASTE ISSUES

2.6 CHLOROFLUOROCARBONS (CFCs)

Air Conditioning and Refrigeration (AC&R) system problems include logistical difficulties with conversions, mechanical seal failures, a cumbersome refrigeration recovery unit, and the need for additional conversions. The Fleet also pointed out that many small units (ice maker, drinking fountains) are not currently scheduled for conversion. Crews also requested more frequent training to keep up with evolving regulations and more trained personnel in this area.

NAVSEA programs underway include:

- Publish a conversion schedule for all ships in Shipboard Environmental Protection Newsletter;
- Perform a tune-up on system in preparation for conversion;
- Development of new mechanical seals; and
- Survey ships for numbers and types of small unit conversions needed.

Other suggestions from the Fleet include:

- Provide an improved ie. (smaller, more portable) recovery unit; and
- Ensure units with old refrigerants are eliminated from stock system.

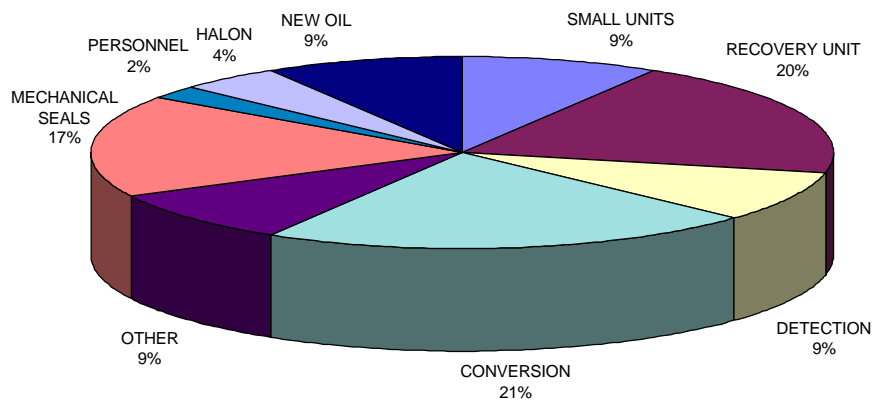


FIGURE 2-5 CFC ISSUES

2.7 PAINT APPLICATION

Four major environmental concerns associated with paints and paint application processes were reported: 1) paint fumes and insufficient ventilation, 2) Difficulty meeting regulatory compliance requirements, 3) limited storage space, and 4) excessive numbers of types of paints.

Initiatives within the Navy to remediate these problems include:

- Shelf Life Extension Committee to extend the shelf life of paints, adjust units of issue, and reform supply management practices;
- Reformulation of paints to ensure regulatory and Navy performance standards compliance; and
- Pollution Prevention Afloat Program: paint dispensers, paint gun cleaning stations, thermoplastic coatings, paint brush cleaners, paint pens, and paint tinting system.

Further investigation is required for these issues:

- Availability of portable fans and respirators to improve ventilation in paint areas;
- Identification of compliant replacement paints;
- Clarification of fresh water washdown procedures and restrictions; and
- Design of a scupper extension from ship's side drains to reduce rusting and dirt from run-off.

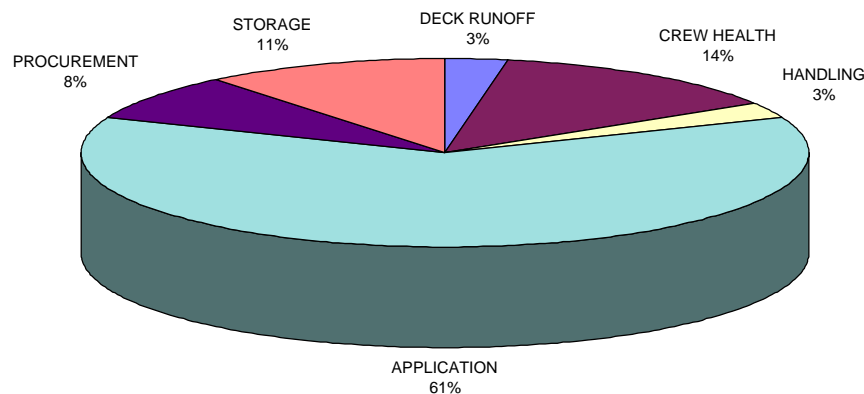


FIGURE 2-6 PAINT APPLICATION ISSUES

2.8 OIL AND HAZARDOUS SUBSTANCE SPILL RESPONSE

Spill response procedures were hindered primarily by the number of spill kits, and the limited supply and restricted use of the oil containment booms. Some crews also reported the need for Shipboard Spill Contingency Plans.

The following areas are being investigated:

- Standardization of spill kits with Military Sealift Command;
- Improvement of boom stability;
- Updated training package with video and Spill Contingency Plan; and
- Development of Standard Afloat Spill Contingency Plan by NAVSEA 03L1.

To guarantee progress in this area, NAVSEA must assign a cognizant department to oversee life cycle management for these issues. NAVSEA 00C, Salvage and Diving, is currently handling spill issues.

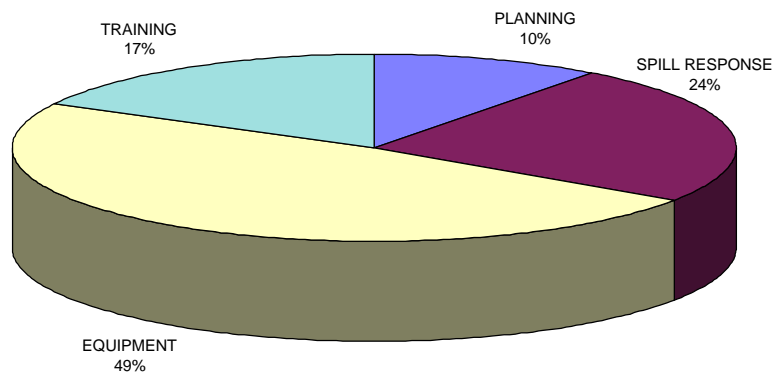


FIGURE 2-7 OIL AND HAZARDOUS SUBSTANCE SPILL RESPONSE ISSUES

2.9 MEDICAL WASTE

Medical personnel requested clear and concise guidance on the segregation of infectious and non-infectious medical waste. Such guidance is necessary to reduce shipboard storage requirements and related disposal costs. Odor from the steam sterilizer caused discomfort and created an uncomfortable working environment for both medical workers and patients.

Available resources in this area include:

- 1) Independent Duty Corpsman School, 2) Hospitalman A-School, and 3) Physician's School at the Universal Health Services Center for medical waste; and
- Various sizes and stocks of storage boxes and bags for easier handling.

Additional suggestions from the fleet include:

- Development of a processor for neutralization and compression of medical waste; and
- Investigation into odor abatement for the steam sterilizer.

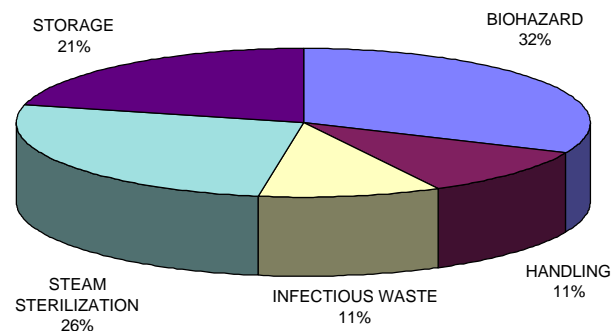


FIGURE 2-8 MEDICAL WASTE ISSUES

2.10 AIR QUALITY

Engine, incinerator emissions and ventilation issues created indoor and outdoor air quality concerns within the Fleet.

NAVSEA has worked to prevent such concerns by:

- Designing current engines and ventilation systems for environmental compliance and crew health and safety; and
- Updating instructions and incorporating complete guidance into 5100.19C Change 1.

Other actions that may be taken include:

- Sample indoor air to determine air quality; and
- Staff all ships or Battle Groups with an Industrial Hygienist.

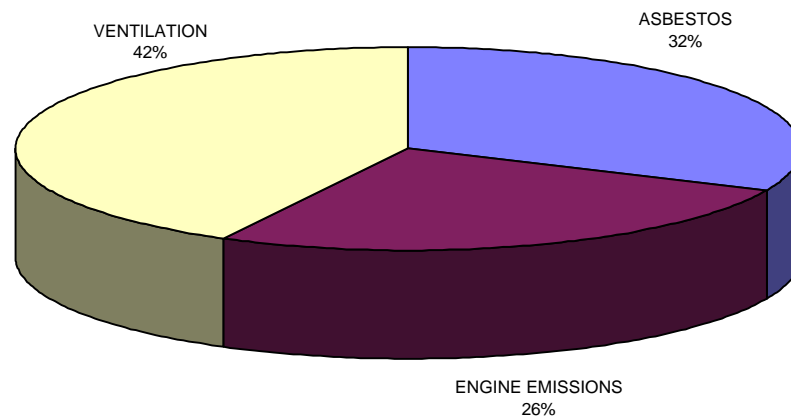


FIGURE 2-9 AIR QUALITY ISSUES